6.0 OTHER MAJOR IMPLEMENTATION ISSUES

Having found Monorail/AGT to be technically feasible, and worthy for further consideration, this section discusses the following issues that must be addressed for further consideration of the transit system:

- Sources of Funding
- Managing Development Pressures
- Environmental Impacts
- Public Involvement

6.1 SOURCES OF FUNDING

In the past 30 years there has been a dramatic increase in the number of automated guideway systems installed in the United States. These systems have been applied to urban applications but are more prevalent at airports. There are innovative procurement and finance techniques for these systems. This section examines the different sources of funding that may be available to finance the Regional Monorail System.

6.1.1 Public Finance Tools

Special Purpose Agencies

Some systems built have been financed through a special purpose agency that focuses on a single project development and is very mission-oriented. They have the ability to operate under budget. They limit the credit exposure of other government agencies. These agencies can be established as public agencies under state law or nonprofit corporations which act as “instrumentalities” of a state or local agency.

Exclusive Development Agreements

The special purpose agency maximizes the role of private sector innovations and efficiency and minimizes the need for public revenues. Private funds are available and revenues needed to operate the system can be obtained from commercial operations such parking fees at stations and their locations. The special purpose agency has the authority to over see the building of the revenue producing improvements associated with the system. Recently in the final phase of building the Vancouver Sky Train system, land owners recognized the economic value of having stations adjacent to their property and three developers came forth at their own cost to finance, design and build and operate three stations.

Design-Build Contracts

With this type of development this contract fixes the project cost early in the design phase and assures that the project schedule will be met. This is the basic building block for many innovative tools.

Long Term Warrantees

A long-term warranty is a promise that ensures the supplier will stand behind the technology. With this instrument, the risk that the technology would not perform is transferred from the public agency to the private company providing the warranty. Long-term warranties show some confidence by manufacturers that their technology system will work properly. In addition, these warranties tend to increase product quality and lower life-cycle costs. Contractor innovation is encouraged and there is the reduced need for public agency inspection/oversight.

Outsourcing Maintenance and Asset Preservation

The direct cost of outsourcing the maintenance of the Monorail/AGT system can be perceived to be higher than hiring in-house. When such cost as capital, operational, and overhead are considered, outsourcing is much more cost-effective over an extended period of time. Outsourcing requires payment for services only when changes are needed. Such cost saving practices support innovation in maintenance/preservation techniques.

Federal Finance Tools

The Transportation Infrastructure Finance and Innovation Act of 1998 (TIFIA) authorized the U.S. Department of Transportation to provide three forms of credit assistance – secured (direct) loans, loan guarantees, and standby lines of credit – for surface transportation projects of national or regional significance. Such major transportation investments include intermodal facilities, border crossing infrastructure, highway trade corridors, and transit and passenger rail facilities. The TIFIA credit program is designed to fill market gaps and leverage substantial private investment by providing supplemental and subordinate capital. The amount of federal credit assistance should not exceed 33 percent of total project costs. Projects must cost at least $100 million or 50% of the State's annual apportionment of federal-aid funds, whichever is less.

Section 311 of the National Highway System Designation Act of 1995 (NHS Act) significantly expanded the eligibility of bond and other debt instrument financing costs for federal-aid reimbursement. This change was codified in an amendment to Section 122 of Title 23 USC. Section 122 makes bond-related costs eligible for federal reimbursement of any federal-aid project eligible under Title 23. As a result, many States have structured project financing that utilizes bond or other debt instrument financing mechanisms to include the payment of future federal-aid funds to retire debt. These mechanisms are called Grant Anticipation Revenue Vehicles or "GARVEE" bonds and Grant Anticipation Notes or "GANS". The bond-related costs eligible for reimbursement include:

1. interest payments and retirement of principal under an eligible debt financing instrument (including any capitalized interest);
2. issuance costs and credit enhancement fees; and
3. any other costs incidental to the sale of an eligible debt financing instrument (as determined by the Secretary of Transportation).

Section 122 clearly states that the eligibility of a debt financing instrument for reimbursement with future federal-aid, to the extent such funding may be available, does not constitute a

commitment, guarantee, or other obligation by the United States to provide for payment of principal or interest, or create any right of a third party against the federal government for payment.

State and Local Finance Tools

State and local government utilize user fee financing techniques such as revenue bonds. Revenue bonds are a type of municipal bond where principal and interest are secured by revenues paid by users of the facility built with the proceeds of the bond issue or from another source of dedicated payments. Some examples include farebox revenue bonds, assessment district bonds, and sales tax and motor vehicle registration fee revenue bonds. These funds may be used to finance project costs that cannot be paid from federal sources.

Joint Development Revenues

The Federal Transit Administration allows considerable flexibility in its treatment of joint development, particularly as it relates to transit supportive development as part of its "Livable Communities Initiative". Grantees can lease air rights above a transit station, or transfer the FTA interest in one property to another, to allow the private development or other use of the property. Examples of this flexibility has been demonstrated in several transit station/housing joint development projects between transit authorities and developers that created both housing and increased parking and intermodal transfers facilities at transit stations.

Collocated Telecommunications Revenue

Transit project right-of-way and stations present an opportunity to enhance both private and public telecommunications capabilities. The transit project owner may charge fair and reasonable rates for the use of its project facilities by those who require telecommunications capacity for themselves or their customers. Facilities can also be designed in conjunction with improvements to the transit agency's radio and emergency response system.

6.1.2 Local Considerations

Responses to the following questions will assist in the development of a strategy for implementing the procurement and financing techniques available for any proposed Monorail/AGT project in the Wilmington region.

Special Purpose Agencies

(1) Does state law allow the affected public agencies to form a separate public agency and/or nonprofit corporation, which could serve as the owner/developer of the monorail project?

(2) Can such an agency issue revenue bonds and grant anticipation notes?

Exclusive Development Agreements, Design-Build Contracts, Long-term Warrantees and Outsourcing Maintenance and Asset Preservation

(1) Does state law allow for a procurement process for the design, construction, maintenance and operation of the project, which results in the award, and execution of a contract following a pre-qualification of bidders and "best and final offer" negotiations?
(2) What are the state law requirements for posting of bonds by contractors on large public works projects?
(3) Does state law require payment of prevailing wages by contractors on public works projects?
(4) Is the public agency owner authorized under state law to make change orders and what is the process for doing do?
(5) Can the public agency owner agree to a dispute resolution process that does not involve filing an action in court or with a regulatory body?

Federal Finance Tools

(1) Which agency acts as the "MPO"(DelDOT/WILMAPCO) for purposes of programming federal grant funds for the project?
(2) How much in STP Urban and CMAQ funds could be available to finance the project?
(3) What sources of funds are available to fund the "local match"?
(4) Describe senior transit management's success in securing local support funding; meeting FTA project performance and performance requirements; establishing and implementing service priorities; operating and maintaining the existing transit system; and track record in completing other projects.

State and Local Finance Tools

(1) Does state law authorize issuance of assessment district, redevelopment tax increment and/or special tax district bonds to pay project costs?
(2) Are motor vehicle fuel taxes and/or vehicle registration fees available at the state or local level to secure revenue bonds and pay operation and maintenance expenses?
(3) Are local governments authorized to levy impact fees on new development that can be used to pay project costs and operation and maintenance expenses?
(4) Are local governments authorized to acquire and dedicate property for right-of-way?
(5) Has an "investment grade" ridership and revenue study been prepared?

Joint Development Revenues, Collocated Telecommunications Revenue

(1) Is the public agency authorized under state law to enter into agreements with private developers regarding parking and station improvements?

(2) Is the public agency authorized under state law to enter into agreements with private telecommunications companies regarding leasing ROW and/or facilities for the creation and/or expansion of a communications (i.e., fiber-optic cable) network?

6.2 MANAGING DEVELOPMENT PRESSURES

New Castle County, the site for the proposed Monorail/AGT system, encompasses approximately 433 miles. Today, the region is home to approximately 200,000 households containing over 494,000 residents. The County is also the site of more than 278,000 jobs across all industrial sectors. This situation will change over the next two decades as evidenced in the projections prepared by WILMAPCO and shown in Table 6.2-1. Both population and employment will grow at a moderate rate of between 10 and 20 percent over the approximately 23 years or between less than one-half and up to one percent per year.

Table 6.2-1
Current and Projected Population and Employment
New Castle County, Delaware

	2000	2025	Percent Growth
Population	494,396	541,949	10%
Households	199,157	237,724	19%
Employment	278,149	324,200	17%

Currently, most of the County, excluding those areas within the City of Wilmington, is primarily residential and of that, the housing stock is primarily single-family dwellings. Table 6.2-2 shows the distribution of land use by major zoning categories.

Table 6.2-2
Land Use by Major Zoning Category

Land Use	Percent of Total
Commercial	14%
Industrial	7%
Multi-family	3%
Single-family	70%
Park	5%
	100%

Ample opportunity exists within the County to accommodate the projected growth in population and employment. While some areas, primarily surrounding I-95 and the urbanized areas have

reach a state of near build-out, most of the region is open to future development. An important element in directing that growth will be the future transportation network for the region.

Transit has the potential to influence the direction that the County takes as it grows. Today, the region is unquestionably auto-oriented. Despite the presence of DART First State bus operations, SEPTA, and inter-city Amtrak service, the majority of trips in the region continue to be made by automobile.

6.2.1 Relationship Between Land Use and Transportation

The New Castle region can be viewed from several perspectives in evaluating its transportation and land use systems. Typically, communities are evaluated from four components:

- Mobility – the ease with which people can move within the region
- Accessibility – the extent to which people can access the various activities within the region
- Livability – generally, the quality of the urban environment and how desirable a place it is to live and work
- Sustainability – the ability of the society to meet its needs without depriving future generations.

Generally, all of these measures increase within a community that coordinates its land use and transportation. Further benefits can accrue by concentrating development and promoting the use of transit through a coordinated and integrated system of higher density development that is oriented toward transit.

Land use organized around a rail transit line, tend to focus development at the various stations. The primary area of greatest development is within walking distance of the station. Development often continues in lower densities as the influence of the transit station dissipates. Properly developed, corridors of higher density development can be created while limiting the corresponding increase in traffic that development typically brings.

6.2.2 Guidelines on Development and Development Levels

Land use and future transit should be carefully coordinated and developed so as to produce both a desirable environment and cost-effective transit operation. Experience has shown that transit functions most effectively in areas in which the level of activity, both population and employment, exceeds 50 persons per square mile. Generally, residential areas with a gross density of 12 dwelling units per acre can generate sufficient ridership to support a high capacity transit line. Increasing densities beyond this level would produce a corresponding increase in ridership. Studies have shown that a 10 percent increase in density can yield a 2 to 3 percent increase in overall transit ridership.

Careful attention should be paid to the areas immediately surrounding the proposed Monorail/AGT stations. Generally, mixed use development with an FAR of 1.0 to 1.5 would develop with proper guidance, around Monorail/AGT stations. Increases of 2 to 3 percent can be

produced by ensuring that the mixed use development includes a significant component of consumer retail development.

Development tends to cluster around the station with most dense development occurring within one-half to one mile of the station. Densities typically taper off rapidly as the distance from the station increases. Land values similarly decline with distance from the station.

The development around the station should be both pedestrian-oriented and transit-friendly. The scale of the development and orientation should focus on the pedestrian and downplay the automobile. Sidewalks and the placement of any parking behind buildings tend to create the type of environment most conducive to transit operations. Buildings themselves should be oriented toward the street. Overall, the area around a transit station should present a safe and comfortable environment.

The organization of the streets and blocks should also promote a pedestrian orientation. Streets of two to four lanes, maximum, are most effective. Relatively short blocks also favor the pedestrian in moving around an area.

6.3 ENVIRONMENTAL IMPACTS (MAPPING OF SENSITIVE AREAS)

The National Environmental Policy Act of 1969 (NEPA), and associated amendments, regulations, and guidelines, generally sets the scope of study for environmental issues associated with transit projects. NEPA requires that any major federal action, in this case the use of federal funds to implement transit in New Castle County, be preceded by a study of the potential environmental impacts associated with the project. As nearly all transit projects make use of some federal funds it is reasonable to assume that the environmental issues raised in NEPA will need to be investigated prior to constructing and operating a Monorail/AGT system in the Wilmington region.

Table 6.3-1 lists the various categories of study for a typical environmental impact statement of a transportation project. Within the various major headings of natural resources, socioeconomics, and manmade environment are several sub-categories. General procedures and practices are followed in carrying out these studies so that a project proponent can both evaluate the impact of a potential transportation project but also identify means of mitigating the consequences.

Generally, most of the potential impacts can be mitigated. At this feasibility phase, few of the potential environmental impacts should be considered as an absolute barrier to advancing a project. Mitigation measures, up to and including relocating the alignment, will generally eliminate or reduce impacts to acceptable levels. In fact, many of the potential impacts are quite site specific. At this early stage, these impacts are far from certain. Other areas, however, give an indication of the potential to be significant obstacles and/or result in appreciable delays to a project's completion.

Table 6.3-1
Environmental Subjects Considered in NEPA Studies

Natural Resources
Wild and scenic rivers
floodplain impacts
coastal zone impacts
wetlands impacts
water quality
threatened and endangered species
prime and unique agricultural lands
stream modifications
visual impacts
roadside vegetation
wilderness areas
Socioeconomics
environmental justice
community cohesion
community impacts
development, revenues, and public expenditures, etc.
park and recreational facilities
bicycles and pedestrians
Manmade Environment
relocation impacts
land use impacts
joint development
hazardous and toxic wastes
corridor preservation
scenic byways
Historic and archeological preservation
Air quality
Noise
Cumulative & secondary impacts

Assuming that the alignment has been developed to complement the land use and development patterns for the region, the principal issues that need to be noted at this stage of the project are:

- Floodplain impacts – encroachment of the alignment upon floodplains.
- Wetlands impacts – encroachment of the alignment upon wetlands.
- Park and recreational facilities – encroachment of the alignment upon or near park and recreational facilities.
- Noise impacts –alignments that pass in close proximity to sensitive noise receptors. At this level of detail, residential property is the principal type of sensitive noise receptor.

Environmental data for this project was supplied by WILMAPCO through their GIS mapping. Table 6.3-2 identifies the extent of potential impacts of the proposed Monorail/AGT route on the various items.

Table 6.3-2
Potential Environmental Impacts of Proposed Alignment

Potential Impact	Measure	Quantity (feet)	Comments
Floodplain	Linear feet and number of stream crossings	11,150 13	Encroachment of the alignment onto the floodplain will be unavoidable in most cases. Adjustments could be made that will reduce stream crossings.
Wetlands	Linear feet	5,150	Adjustments to the alignment would reduce length of the Monorail/AGT line in wetland, however some encroachment will be necessary to provide service to Wilmington Amtrak Station.
Parks & recreational facilities	Linear feet and number of facilities	700 1	The line may run along the edge of a small section of Brandywine Park in Wilmington. A small adjustment to the alignment could avoid this.
Noise impacts	Linear feet through both single-family and multi-family residential areas	37,800	More detailed analysis would be necessary to identify areas with significant noise impacts.

Additional impacts can be expected to accrue at the Monorail/AGT stations. While the typical station would be elevated and with a minimal footprint, it is likely that feeder bus service, parking, and passenger drop-off facilities would be constructed at some of the station locations. Appreciable land taking and encroachment into manmade and natural environments could result. The extent of any impacts would depend upon the magnitude of the passenger interchange facilities.

Similarly, any Monorail/AGT operation would require a storage and maintenance facility. The size of the facility would depend upon the fleet size required to serve the corridor but would encompass as much as 90 acres. Storage and maintenance facilities are generally industrial in nature requiring designs and practices to mitigate resulting noise and toxic and hazardous wastes, and therefore must be carefully located to as not to adversely affect communities. The facility itself, including any additional tail track to connect the facility with the mainline, would have potential environmental consequences. The full extent of the impacts could only be ascertained after the facility is sized and located.

Mitigation Measures

Generally, the anticipated impacts can be mitigated. Coordination with resource agencies, minor shifts in the alignment, construction of physical barriers, and other means should render the alignment feasible. Subsequent to this study, the following actions should be taken to clarify potential impacts and respond accordingly.

- Floodplain impacts – check Federal Emergency Management Administration flood plain mapping. Given that the Monorail/AGT is likely to be entirely on structure, proper placement of support columns should minimize any significant impacts. Station areas would require special attention and could represent the greatest encroachment on floodplains. U.S. Army Corps of Engineers 404 permit(s) could be required.
- Wetlands – check Federal Emergency Management Administration and United States Geological Survey mapping. Given that the Monorail/AGT is likely to be entirely on structure, proper placement of support columns should minimize any significant impacts. Station areas would require special attention and could represent the greatest encroachment on wetlands. U.S. Army Corps of Engineers 404 permit(s) could be required.
- Parks & recreational facilities – alignments potentially affecting publicly owned parks, wildlife/waterfowl refuges, recreational facilities, and significant historical sites may require a Section 4(f) statement. These lands may not be crossed except after demonstrating no "prudent and feasible alternative." Station areas would need to be established that did not encroach upon these facilities. Orientation to create pedestrian-oriented facility that tied into the park or recreational facility would be beneficial.
- Noise impacts – detailed noise studies would be required. The Federal Transit Administration offers guidelines on permissible noise thresholds that cover both changes in ambient noise and maxima. Construction of sound barriers could be required. Noise impacts could be most significant in the vicinity of the stations where vehicles would be stopping and accelerating. Noise from buses and automobiles could also be significant in the station areas. Appropriate screening and operational practices might mitigate adverse impacts.

6.4 PUBLIC INVOLVEMENT

The Wilmington Monorail Exploratory Study was carried out with a significant public participation element. Stakeholders in the eventual outcome of this project were included at several levels. The public was therefore given an opportunity to stay informed on the project and to offer the Project Team input and comment as the study progressed.

The project was managed by the Management Committee. This committee composed of staff from Delaware Department of Transportation, as well as WILMAPCO and the localities within New Castle County. The Committee advised the Project Team and reviewed the data, methods, and findings of the project.

A Steering Committee, composed of nearly 90 individuals representing the private sector, public interest organizations, and various public agencies. The Steering Committee Meetings were open to the general public and offered participants an opportunity to review the direction of the project and influence its course.

One Open House Meeting was conducted on September 25, 2002, in which WILMAPCO presented the status of the project and again, gave members of the general public an opportunity to offer input to the project. The results of an unscientific survey collected during the meeting is presented in Appendix C.

WILMAPCO, www.wilmapco.org/monorail/index.htm, also maintains a website, located on the WILMAPCO home page www.wilmapco.org. The website presents the intermediate products, general information on monorail systems, and minutes of the various Management and Steering Committee meetings.

6.4.1 Summary of Key Meetings

At the first Steering Committee Meeting, held on June 24, 2002, the Project Team presented background on the project. A Purpose and Need Statement was discussed and input received on key issue that members of the committee and the general public would like to see considered. The committee also received a presentation on Monorail/AGT systems including their relative merits and case studies of where they have been deployed.

The second Steering Committee Meeting was held on August 28, 2002. At this meeting, the Project Team reviewed and finalized the purpose and need statement and worked with the committee to formulate an initial corridor for analysis. The Project Team also presented additional information on Monorail/AGT technologies.

A meeting with the Management Committee was also conducted in advance of the August 28 Steering Committee meeting at which similar topics were reviewed. Minutes from both meeting dates are contained in Appendix B.

6.4.2 Direction from the Public

Generally, the public has been supportive of efforts to develop a Monorail/AGT system for the New Castle Region. Among the motivations for such a system would include:

- Traffic congestion
- Deteriorating air quality and the prospect of non-attainment status
- Remedying suburban sprawl
- Stimulating economic growth

The public also identified several needs to which Monorail/AGT might be respond. These comments responded both to regional needs and future prospects for a high quality transit system within the New Castle Region.

- Effectively serve both the central city and suburban employment centers
- Encourage shift from single occupancy vehicles to high occupancy vehicles
- Mitigate growing highway congestion
- Mitigate deteriorating air quality conditions
- Integrate the proposed system with other modes of travel
- Supporting regional growth
- Improving connectivity between the Region and Wilmington, Philadelphia and other urban centers.

6.4.3 Future Public Involvement

Both the Federal Transit Administration New Start Program and the NEPA environmental study process strongly encourage a public involvement program that actively solicits input from the general public. An effective public involvement program also creates a dialogue between the project proponents and the affected community. The public involvement program initiated in this exploratory study will need to be continued and expanded as this study moves forward.